

Remarks

Applicants thank the Examiner for her careful consideration of this application and for the helpful interview conducted on April 19, 2004. Reconsideration of this Application is respectfully requested in view of the interview, the amendments above, and the remarks below.

Upon entry of the above amendments, Claims 1-38 remain pending in this application, with Claims 1, 29, 31, and 35 being independent claims.

During the interview, it became apparent that the Examiner had interpreted the independent claims as not being limited by their preambles, despite Applicants' remarks in their response submitted October 17, 2003 that indicate that the preambles are to be given patentable weight (see, for example, the description of Claim 1 at Page 2). To further clarify this, Applicants have elected to amend each independent claim to incorporate the substantive portion of each preamble into the body of each independent claim. Applicants respectfully submit that this is consistent with their remarks in the submission of October 17, 2003 and thus does not raise any new considerations. Accordingly, Applicants respectfully request entry and consideration of the claims as amended.

In the Office Action, Claims 1-38 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Hooper et al. (U.S. Patent No. 5,493,638) with Bonneau et al. (U.S. Patent No. 6,002,794). These rejections are respectfully traversed for at least the same reasons discussed in Applicants' paper submitted October 17, 2003. For the Examiner's

convenience, however, these will be reiterated below, along with some additional embedded comments.

The invention as claimed in Claim 1 is directed to a method of extracting overlays from video. These overlays are pre-existing in the video sequence and are not created by the claimed method. The method includes steps of detecting at least one potential overlay and verifying that the at least one potential overlay is an actual overlay.

Hooper et al., noting, e.g., col. 2, line 38 to col. 4, line 24, describes a system for facilitating interactive video systems. The system of Hooper et al. creates a background image and superimposes on it foreground images. The results are compressed and stored in the form of an **independent frame**, representing a static portion of the video, and **change frames**, representing differences between pairs of video images. **Nowhere does Hooper et al. address the question of how to detect an overlay from a video sequence.** Rather, Hooper et al. is concerned only with the **creation** of separate background and overlays (see, also, col. 5, line 31 to col. 7, line 65 and Figs. 2 and 3).

Bonneau et al., noting, e.g., col. 3, line 64 to col. 4, line 67, describes a scheme for compression of video based on spatio-temporal wavelet decomposition of video imagery. Furthermore, the portion cited in the Office Action (col. 21, lines 19-28) is directed to generating a text overlay based on the results of matching an image of an object to one in a database. **This is neither detecting a potential overlay nor verifying that the potential overlay is an actual overlay. In fact, Applicants are unable to locate any relevant teachings in Bonneau et al.**

In view of these points, it is respectfully submitted that neither Hooper et al., Bonneau et al., nor their combination discloses or suggests the invention as claimed in Claim 1.

Furthermore, independent Claims 29, 31, and 35 all include the features of Claim 1. For at least this reason, it is respectfully submitted that all of the claims, Claims 1-38, are allowable over the cited prior art.

There are, however, additional differences between Hooper et al. and Bonneau et al. and other claims, among which are the following.

Claim 2 recites the use of post-processing of an actual overlay to remove extraneous pixels. The Office Action recites Bonneau et al. at col. 6, line 18 to col. 7, line 67 as teaching this. However, noting, for example, col. 6, lines 18-22, the cited section is describing an image encoding method, not post-processing of an actual overlay. Furthermore, the method of Bonneau et al. is **not** removing any pixels; rather, it is decomposing an image into spatial frequency regions (for encoding). Hooper et al. also contains no such teaching. Therefore, it is submitted that Claim 2, as well as Claim 3, which depends from Claim 2, are allowable over the cited prior art.

Claim 3 depends from Claim 2 and further recites computing a variance for each pixel of an actual overlay and comparing it with a threshold to determine whether or not it is extraneous. Applicants find no such teachings in either Hooper et al. or Bonneau et al.

Claim 4 depends from Claim 1 and includes a step of performing neural network processing on extracted features. Nowhere in the cited portion of Bonneau et al. (col. 11, lines

14-67 and Figs. 2 and 5) have Applicants been able to locate any such teachings. Note that Claims 5-21 depend from Claim 4, and therefore, these arguments apply to Claims 5-21, as well.

Claim 5 depends from Claim 4 and recites utilizing three-layer back-propagation neural network processing. The Office Action cites Bonneau et al. at col. 12, lines 1-65 as teaching this.

However, Applicants have been unable to locate any such teachings (or indeed, any teachings of using any type of neural network processing) in Bonneau et al. The cited passage appears to address scaling and changing resolution ("three-scale processing").

Claim 6 depends from Claim 4 and recites performing temporal and spatial verifications. The Office Action cites Bonneau et al., Fig. 1, element 115 and Fig. 6, element 525 (assumed to refer to Fig. 5, given that element 525 is in Fig. 5, not Fig. 6), as teaching these limitations. However, the cited elements of the figures refer to spatial decomposition and spatial representation. Neither of these is a verification step. Also, neither of these is a temporal verification step. Note that Claims 7-21 depend from Claim 6, so these arguments apply to Claims 7-21, as well.

Claim 7 depends from Claim 6 and recites further steps relating to temporal verification, and the Office Action relies on Bonneau et al. at col. 4, lines 51-67 and col. 8, lines 36-63 to teach these further steps. However, Applicants are unable to locate such teachings. The cited passages appear to deal with determining and encoding inter-frame differences in video, rather than with temporal verification of an overlay (i.e., that the potential overlay is, actually, an overlay). Furthermore, Applicants are unable to locate in the cited passages any teachings

regarding the use of mean square errors in the process. Note that Claims 8-14 depend from Claim 7, so these arguments apply to Claims 8-14, as well.

Claim 8 depends from Claim 7 and recites the selection a pixel of the potential overlay and recording its coordinates, as well as recording the translated coordinates of the pixel according to a minimum mean square error (found in the steps of Claim 7). The Office Action cites Bonneau et al. (col. 14, line 52 to col. 15, line 46; col. 21, line 29 to col. 22, line 52; and Figs. 7 and 13) as teaching this. It appears that these passage deal with recording of data different from that claimed. Furthermore, as discussed above, mean square errors are not generated or used in Bonneau et al. Note that Claims 9-14 depend from Claim 8, so these arguments apply to Claims 9-14, as well.

Claims 9-14 depend from Claim 8 and recite various further steps relating to, for example, error counts. Nowhere in the cited passages of Bonneau et al., which are as discussed above for Claim 8, or anywhere else in Bonneau et al., have Applicants been able to locate any such teachings.

Claim 15 depends from Claim 6 and recites determining a structure confidence and a texture confidence as part of the step of spatial verification. Nowhere in Bonneau et al. have Applicants found teachings suggesting such confidence determinations. Note that Claims 16-21 depend from Claim 15, so these arguments apply to Claims 16-21, as well. Furthermore, given these arguments, Bonneau et al. can not possibly teach the further features of Claims 16-21.

Claim 22 depends from Claim 1 and recites that the detecting step comprises performing template matching. The Office Action recites the same passages of Bonneau et al. cited above in connection with Claim 7 as teaching this further limitation. Applicants have found no use of template matching in these passages. Note that Claims 23-25 depend from Claim 22, so these arguments apply to Claims 23-25, as well.

Claim 24 depends from Claim 22 and recites that verifying includes frame-to-frame correlation of a potential overlay and comparing the correlation result with a threshold. Again, the same passages of Bonneau et al. were relied upon in the Office Action, and again, Applicants have found no such teachings in these passages or anywhere else in Bonneau et al. This argument also applies to Claim 25, which depends from Claim 24.

Claim 25 depends from Claim 24 and further recites that the frame-to-frame correlation comprise forming a mean square error over a set of video frames, averaged over all of the pixels of a potential overlay. The Office Action relies upon Bonneau et al., col. 6, lines 46-67, col. 7, lines 50-67, col. 11, lines 14-67, and Figs. 2 and 5 to teach this limitation. However, Applicants have been unable to locate such teachings in any of the cited portions of Bonneau et al.

The arguments applied above to Claims 1, 4, and 22 apply to Claims 29 and 30, and the arguments applied above to Claim 6 with respect to temporal verification also apply to Claim 30.

The arguments applied above to Claims 1 and 4 apply to Claims 31-34. The arguments applied above to Claim 6 also apply to Claims 32-34. The arguments applied to Claim 15 also

apply to Claim 33. Arguments similar to those applied to Claims 7, 24 and 25 also apply to Claim 34.

Arguments similar to those applied above to Claims 1, 22, and 24 also apply to Claims 35-38. The arguments applicable to Claim 23 also apply to Claims 36-38.

Claim 37 depends from Claim 36 and further recites determining a template by addition or frame-by-frame subtraction of video frames. Claim 38 also depends from Claim 36 and further recites determining a template by segmenting video frames into foreground and background objects and determining, by correlation tracking, if any foreground object remains in the same absolute location from frame to frame. The Office Action relies on Bonneau et al., noting col. 4, lines 51-67 and col. 8, lines 36-63, to teach these features. However, nowhere in these passages (or anywhere else in Bonneau et al.) have Applicants been able to locate any such teachings. Bonneau et al. does not appear to use template matching at all and, accordingly, does not address how templates are determined.

Given the above arguments, it is respectfully submitted that Claims 1-38 are allowable over the cited prior art.

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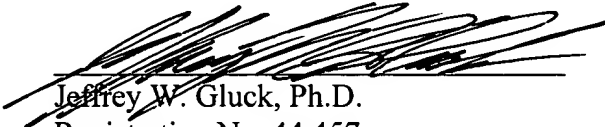
Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants, therefore, respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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